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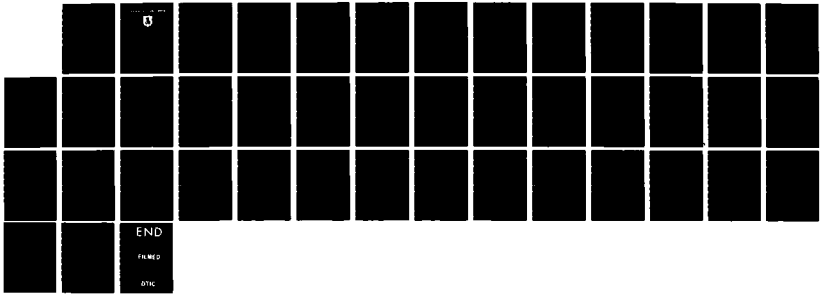

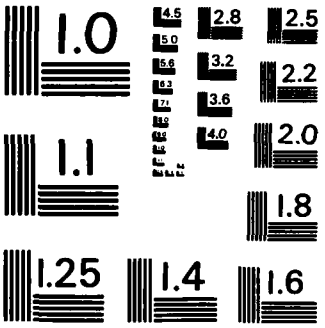

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AIR FORCE SYSTEMS COMMAND

AD-A159 344

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LOGISTICS MODELS AND TECHNIQUES

COMPILED BY HQ AFSC/ALT

SEPTEMBER 1984

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FOREWORD

1. This compilation represents the initial effort by HQ AFSC/ALT, Directorate of Concepts and Analysis, DCS/Acquisition Logistics to provide a consolidated listing of the major logistics analysis models/techniques currently in use by or in conjunction with AFSC. It was prepared from information provided by model developers, using agencies, and current user's guides and model documentation. Our intent is for this information to form the basis for broader use of good models/techniques, and perhaps to help eliminate or initiate major improvement to those which are not being used.

2. We solicit your help, as users and developers of logistics analysis models/techniques, in helping us keep current on any changes/additions /deletions which should be made to this compilation. We are particularly interested in assessments of the utility of the models/techniques currently in use. In addition, information on new applications and information on models/techniques not listed is also requested. Our points of contact for this endeavor are Ms Freda Kurtz and Capt Nick Reybrock, ALTA, AUTOVON 858-3915, Commercial (301) 981-3915.

Richard B. Braxton, Jr.

RICHARD B. BRAXTON, JR. Col, USAF
Director, Concepts and Analysis
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LOGISTICS ANALYSIS MODEL/TECHNIQUE

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MISCELLANEOUS REPORT GENERATORS AND MODELS

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: AD Operation and Support Model

TYPE MODEL: Resource Estimating; Cost Estimating

DEVELOPED BY: AD/ALT and AD/ACCI

DATE COMPLETED: April 1981

CURRENT REVISION: Original Version

PRODUCT DIV USE/SYSTEMS USED ON: AD/missiles and munitions studies

DOCUMENTATION: Missiles/Munitions Design Trade-off Model Users Guide

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model consists of two major parts. One part is an operation model which generates hardware failures, personnel requirements, and tracks the status (good or bad) of items in the inventory. The other part of the model accumulates O&S costs based on system failures and personnel requirements. There is also a spare parts routine which calculates stockage levels to satisfy availability goals. The model is designed to address three areas of concern:

a. Estimating cost of a design change.
b. O&S estimations to be used in total Life Cycle Cost (LCC) studies.
c. Inventory availability resulting from hardware reliability, maintainability, and periodic inspection schemes.

REMARKS:

ACCESS PROCEDURE: Operational on AFLC CREATE System, WPAFB, and on the CYBER, Eglin AFB.

SPONSOR: AD/ACCI

CONTACT(S): Mr Wayne Foster, AD/ACCI, AUTOVON 872-5746

DLSIE REF#: None

ASSESSMENT: The model was used extensively in the past by AD. However, since the nature of AD's work has shifted away from consideration of O&S cost estimations, the model is not currently being used.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: AIM/AGM Logistics Reliability Assessment and Captive Carry Summary

TYPE MODEL: Reliability; Miscellaneous Report Generator

DEVELOPED BY: Warner Robins (WRALC/MM)

DATE COMPLETED: 1980

CURRENT REVISION: Scheduled to be released August 1984

PRODUCT DIV USE/SYSTEMS USED ON: WRALC/AIM-9L/M/P, AIM-7E/F, AGM-45

DOCUMENTATION: Informal notes

PROGRAM LANGUAGE: COBOL

DESCRIPTION/CHARACTERISTICS: The AIM/AGM Logistics Reliability Assessment and Captive Carry Summary is an official WRALC evaluation report generated to provide information on missile G&C (Guidance and Control) failures, usage, and repairs. Information is developed on receipt reliability, captive carry reliability, and document reliability.

REMARKS: The model is currently undergoing extensive work to transfer it to an HP3000 minicomputer.

ACCESS PROCEDURE: WRALC/MME, Robins AFB

SPONSOR: WRALC/MM

CONTACT(S): Mr Robert D. Warren, WRALC/MMEL, AUTOVON 468-2711

DLSIE REF#: None

ASSESSMENT: The information developed by this model provides operational effectiveness and satisfies reporting requirements on missile reliability and high time identification. The model is currently used for the Sidewinder (AIM-9L/M/P), Sparrow (AIM-7E/F), and Shrike (AGM-45).

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Avionics Software Support Cost Model (ASSCM)

TYPE MODEL: Cost Estimating

DEVELOPED BY: SYSCON

DATE COMPLETED: July 1982

CURRENT REVISION: Original Version

PRODUCT DIV USE/SYSTEMS USED ON: Not currently used

DOCUMENTATION: ASSCM Draft User's Manual, Oct 82

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The objective of this model is to estimate the software support costs of various functional types of avionics equipment during the conceptual program phase. This is a predictive model which will handle systems whose expected life is between the year 1970 and 2025.

REMARKS: The model was derived from data secured from Air Logistics Centers and thus is based on Air Force experience.

The model may be used to project costs for the following systems:

1. Navigation Weapon Delivery (OFP)
2. Jammer (EW)
3. Fire Control (OFP)
4. Receiver (EW)
5. Integrated System (EW)
6. Navigation Fire Control Weapon Delivery (OFP)
7. Command and Control (CE)

ACCESS PROCEDURE: Via AFWAL/CDC6600, VAX 11/780

SPONSOR: Previously Mr Dan Ferens, AFWAL/AAAS-2, AUTOVON 785-3765

CONTACT(S): None

DLSIE REF#: 84/248 (LD 55813MA)

ASSESSMENT: The office which developed this model has been dissolved. The model is not currently being used.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Budget Readiness Analysis Technique (BRAT)

TYPE MODEL: Logistics Capability Assessment

DEVELOPED BY: AFALC/XRS

DATE COMPLETED: September 1983

CURRENT REVISION: Original Version

PRODUCT DIV USE/SYSTEMS USED ON: ASD/T46A, B52 PAVE MINT

DOCUMENTATION: Brat Users Guide, February 1984

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model provides a quick capability for prediction of readiness and/or availability. The model was designed to provide early insight into the type of information which the Logistics Composite Model (LCOM) can generate only after detailed networks have been developed and detailed input data have been prepared.

REMARKS: The model is designed for rapid turnaround and therefore does not provide the level of precision or detail of which LCOM is capable.

ACCESS PROCEDURE: CREATE System (Wright-Patterson AFB OH)

SPONSOR: AFALC/XRS

CONTACT(S): Mr Don Dyer, AFALC/XRS, AUTOVON 785-5862

DLSIE REF#: 84/99 (LD 55515MA)

ASSESSMENT: BRAT is a "psuedo simulation," which looks at the interaction of multiple resources. It runs in a real-time environment requires minimum data, and addresses non-linear maintenance/operational relationships. A second version, which will take into consideration the variability of random events, is under development. Since the model is of recent origin and can provide capabilities which management needs, it should be supported and improved where necessary.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Computer Supported Network Analysis System (CSNAS)

TYPE MODEL: Scheduling

DEVELOPED BY: AFALC/XRI

DATE COMPLETED: 1981

CURRENT REVISION: February 1984

PRODUCT DIV USE/SYSTEMS USED ON: ASD/B-1B, F-16 (FMS Program), C-17, HH-60D, B-52 (Deployment Office), PLSS, LANTIRN, TRL-1, EF -111, F-101 Engine. ESD, SD/Numerous programs.

DOCUMENTATION: Users Guide, and Computerized On Line Users Guide

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model is a government owned and operated project management (PERT-TYPE) package which includes government developed software that operates on a government leased HP 3000 minicomputer at each AFSC product division. The model produces tabular reports, milestone charts, and network diagrams. The network analysis develops a logical schedule, determines the critical path, identifies which jobs have slack time and how much, and integrates the separate schedules of all portions of a project.

REMARKS: Transfer to a DEC VAX 11/780 is planned.

ACCESS PROCEDURE: Used on a HP 3000 minicomputer with remote terminals and either a CALCOMP plotter or an HP plotter.

SPONSOR: AFALC/XRN

CONTACT(S): Mr David Neise, AFALC/XRI, AUTOVON 785-3731
Mr Albert L. Clark, AFALC/XRI, AUTOVON 785-3731
Mr Robert Trigg, AD/ALT, AUTOVON 872-2300/4304
Mr J. Albergo/Mr G. Calandriello, ESD/ALL, AUTOVON 478-2002/5708
Mr R. Roy, SD/ALX, AUTOVON 833-1810
Ms Carol Dey, BMO/ALX, AUTOVON 876-3241/2931

DLSIE REF#: 84/278 (LD 52917MA)

ASSESSMENT: Work is continuing to further develop the overall software package into a progressively more comprehensive network analysis based Management Information System. The February 1984 revision added improved capability to the model.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Munitions Handling Equipment (MHE) Model

TYPE MODEL: Resource Estimating

DEVELOPED BY: AD/XRP

DATE COMPLETED: November 1981

CURRENT REVISION: Original Version

PRODUCT DIV USE/SYSTEMS USED ON: AD for MHE Roadmap Study

DOCUMENTATION: Armament Division Technical Report 83-8, February 1983

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The MHE Model depicts a flow process of the overall munitions system. The model may be applied to a wing/squadron either deployed or in place at a home base. It addresses those operations performed in support of combat sorties (receiving, assembly, storage, transportation, and loading), and allows performance of tradeoffs between the various operations once the unit, base, and assets (personnel and equipment) have been specified.

REMARKS:

ACCESS PROCEDURE: Operational on CYBER computer, Eglin AFB

SPONSOR: AD/XRP

CONTACT(S): Mr John D. Martel, AD/XRP, AUTOVON 872-4711

DLSIE REF#: B073678L

ASSESSMENT: The model has been successfully used for MHE studies. Minor changes to expand model capabilities are expected to occur in the future. These changes are expected to include the expansion of input parameters, and the ability to increase the number of weapons, aircraft, and/or bases the model can process at any one time.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Munitions Design Trade/Operation and Support Cost Model

TYPE MODEL: Cost Estimating

DEVELOPED BY: AD/ACCI, with assistance from AFALC/XRS

DATE COMPLETED: 1980

CURRENT REVISION: April 1981

PRODUCT DIV USE/SYSTEMS USED ON: AD

DOCUMENTATION: Munitions Design Trade/Operation and Support Cost Model, April 1981.

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model is structured to satisfy the peculiar operation and support characteristics of missiles and munitions, such as low usage rates, extended periods of storage, and periodic inspections or surveillance program. The model calculates operation and support costs and provides a system availability measure based on the defined operation and maintenance scenario. It is a powerful tool in trading off design characteristics and maintenance concepts.

REMARKS: The model includes factors for yearly deployment of assets, yearly base build up, and variable yearly rate for assets in storage environments. The operations model calculates the personnel requirements and the system hardware failure data, and provides this information to the cost equations.

ACCESS PROCEDURE: AD, Eglin CDC

SPONSOR: AD/ACCI

CONTACT(S): Mr Hugh T. Stallworth, AD/ACCI, AUTOVON 872-5756
Mr Ron Streight, AD/AL, AUTOVON 872-8719

DLSIE REF#: None

ASSESSMENT: The model is being used for operation and support cost estimation. It is also appropriate for logistics trade-off studies. It provides management information that is useful to the decision maker, and should be utilized in appropriate munitions applications.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Modular Life Cycle Cost Model (MLCCM)

TYPE MODEL: Cost Estimating

DEVELOPED BY: Grumman Aerospace Corporation, Bethpage, NY 11714

DATE COMPLETED: 1978

CURRENT REVISION: 1984

PRODUCT DIV USE/SYSTEMS USED ON: ASD

PROGRAM LANGUAGE: FORTRAN

DOCUMENTATION: MLCCM for Advanced Aircraft Systems, Phase III
Vol I, Rev I - Cost Methodology Development and Application
Vol II, Rev I - Master Control Program - User's Manual
Vol V, Rev I - Operations and Support Phase Expansion
Vol VI, Rev I - Master Control Program II - User's manual

DESCRIPTION/CHARACTERISTICS: This is a FORTRAN based model which was developed to enable design engineers to perform trade-offs of competing aircraft design configurations early in conceptual and preliminary design phases. It relates performance and design characteristics to Unit Production Cost (UPC) and Operation and Support (O&S) costs. This is an interactive model. RDT&E costs developed in the model are visible at the engine, avionics, and airframe levels only. There is differentiation between cargo/tanker/transport and fighter/attack aircraft. The model was developed to be used during the early acquisition cycle for aircraft costing and design tradeoffs.

REMARKS: The Flight Dynamics Laboratory is developing an option to the model to estimate corrosion impact on operating and support costs.

ACCESS PROCEDURE: CREATE and CDC 6600 System

SPONSOR: AFFDL

CONTACT(S): Mr N. L. Sternberger/Ken Mumford, Flight Dynamics Lab, WPAFB OH, AUTOVON 785-5888

DLSIE REF#: 83/61, 62, 63 (LD 4642MD/E/H)

ASSESSMENT: MLCCM is a parametric model developed using data for selected aircraft systems and subsystems during the mid-1970s. No program exists to update the parametric cost estimating relationships with new data. It is not currently being used for management decisions.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Model for System Effectiveness Assessment of Ammunitions Loader(s) for the GPU-5A Gun Pod

TYPE MODEL: Miscellaneous Models, (Loading Concept Evaluator)

DEVELOPED BY: AD/ALT

DATE COMPLETED: August 1982

CURRENT REVISION: Original version

PRODUCT DIV USE/SYSTEMS USED ON: AD/GPU-5A Gun Pod

DOCUMENTATION: Available from AD/ALT, Eglin AFB.

PROGRAM LANGUAGE: SIMSCRIPT

DESCRIPTION/CHARACTERISTICS: The model was developed to evaluate the effect of different loading concepts for the GPU-5A gun pod. The GPU-5A gun pod will be deployed in three types of squadrons: Rapid Deployment Force, Wild Weasel, and air-to-ground squadrons. The gun pod can be reloaded by (1) a modified loader, (2) a new simplified loader or (3) by hand loading. The model is a simulation programmed in SIMSCRIPT II.4

REMARKS:

ACCESS PROCEDURE: Operational on CREATE computer at Wright-Patterson AFB.

SPONSOR: AD/ALT

CONTACT(S): Mr Harold Moore, AD/ALT, AUTOVON 872-4304

DLSIE REF#: None

ASSESSMENT: The model was used specially for the GPU-5A gun pod trade-off studies. It may be tailored for similar applications if requirements occur in the future for trade-off studies of weapon systems resembling the GPO-5A gun pod.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Logistics Training Requirements

TYPE MODEL: Resource Estimating, (Training Requirements)

DEVELOPED BY: ESD/ALL

DATE COMPLETED: 1983

CURRENT REVISION: Original version

PRODUCT DIV USE/SYSTEMS USED ON: ESD. Used in entire AL matrix involving more than 200 persons.

DOCUMENTATION: Informal notes

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model identifies logistics training requirements by person. It provides a computerized program to collect data on logistics training received by person and on training courses available and/or scheduled. The model provides an equitable procedure for allocating training to personnel. The model also provides a computerized tool for responding to logistics training spaces which may become available on short notice.

ACCESS PROCEDURE: AFLC CREATE System

SPONSOR: ESD/ALL

CONTACT(S): Mr Joseph P. LaBelle, ESD/ALL, AUTOVON 478-3852

DLSIE REF#: None

ASSESSMENT: ESD/AL has used the model successfully and believes it has aided management in the administration of training requirements and in the assignment of training opportunities.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Logistic Support Cost Model (LSC)

TYPE MODEL: Cost Estimating

DEVELOPED BY: AFLC/MMOAA

DATE COMPLETED: 1972

CURRENT REVISION: Version 1.1, January 1979

PRODUCT DIV USE/SYSTEMS USED ON: Most product divisions

DOCUMENTATION: Logistics Support Cost User's Handbook, AFALC/XRS

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model is used for the purpose of estimating the design related support costs that may be incurred by making a particular design decision for a given weapon system or piece of equipment. The model is intended for application in three areas: (1) estimate differential logistics support costs during source selection, (2) discriminate among design alternatives during prototyping for full-scale development, (3) establish a baseline for contractual commitments on certain aspects of operational supportability which will be subject to verification.

REMARKS: The model is used for design tradeoffs and source selection evaluation. It is also used in logistic support projections.

Several versions of this model,in addition to the AFLC version, are currently being used by many organizations.

ACCESS PROCEDURE: CREATE System

SPONSOR: AFALC/XRS

CONTACT(S): Lt Karen Cromer, AFALC/XRS, AUTOVON 785-5146
ASD/ALT, AUTOVON 785-6217

DLSIE REF#: None

ASSESSMENT: The use of this model is being phased out. Except for archival purposes, this model is no longer supported. Recommended replacements are LCC-2A, LCCA, and ONSCOST.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Logistics Composite Model (LCOM)

TYPE MODEL: Logistics Capability Assessment

DEVELOPED BY: RAND DATE COMPLETED: 1966 CURRENT REVISION: 1983

PRODUCT DIV USE/SYSTEMS USED ON: ASD/F15, F16, A10, F111, ATF; AFOTEC; TAC; SAC; MAC; (various systems); contractors.

DOCUMENTATION: Simulation Software Users Reference Guide, 15 Apr 81, AFR 25-5, 25-8, May 1980, and CDC/IBM Users Guide Job Control Language for LCOM, Nov 1981

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model simulates airbase logistics support operations. It measures sortie generation capability, aircraft maintenance manpower requirements, and aircraft supportability. It considers the interactions of all support resources (i.e., manpower, spares, support equipment, facilities) and is useful for trade studies and sensitivities of aircraft logistics performance. It provides information on which to base comparisons of sortie gereration capability of alternative weapon systems. It is also useful for manpower determination planning and tradeoffs concerning supportability.

REMARKS: Typically a very complex model to run, i.e., typical input consists of 8,000 to 10,000 lines of network code. Input contains information on failure rates, resources, tasks, aircraft operations, maintenance policies, mission types, priorities, cancellation policies, and tradeoff times. Data usually extracted from comparable systems early in system development. Outputs include performance statistics on mission success, aircraft availability, manpower usage, supply, shop repair, support equipment and facilities.

ACCESS PROCEDURE: Available on CDC, Honeywell, and IBM systems.

SPONSOR: ASD/ENSSA

CONTACT(S): Mr R. Kronk, ASD/ENSSA, AUTOVON 986-0064
Mr William Drake, Air Force Maintenance, Supply, and Munitions Management Engineering Team (AFMSMMET), AUTOVON 787-3795

DLSIE REF#: 84/82 (LD 53358M); 84/161 (LD 33938MF)

ASSESSMENT: LCOM provides the best analytical process for modeling the pre-flight and post-flight logistics tasks associated with aircraft missions. It may also be used to model logistics operations for other than aircraft weapons systems or subsystems. However, LCOM is a complex model, and learning to run the model requires a significant amount of time. Also, the actual preparation of input data is a time consuming operation. For important evaluations or major management decisions, the effort and time required is justified. Significant data base construction software has been developed to convert historical operational base level maintenance data to unscheduled maintenance network definitions for existing systems. Similar capabilities are lacking for postulated systems.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: LCCA - Life Cycle Cost Analysis Model

TYPE MODEL: Cost Estimating

DEVELOPED BY: The Analytical Sciences Corporation (TASC), 6 Jacob Way, Reading, MA 01867

DATE COMPLETED: 1977

CURRENT REVISION: 1981

PRODUCT DIV USE/SYSTEMS USED ON: ASD

DOCUMENTATION: LCCA Training course (May 77); LCCA General Information 9 Guide Oct 81; Life Cycle Cost Analysis Program Users's Guide, July 1979

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: An accounting-type model that uses alternative support concepts, sensitivities, operations data, and logistics planning to estimate Operational and Support (O&S) costs. It can handle a wide variety of applications depending on files selected. The six input files are: standard cost factors file, logistics factors file, hardware definition file, support equipment definition file, contractor data file, and throughput file.

REMARKS: The current versions are LCCA10 and LCCT

ACCESS PROCEDURE: GE Timeshare System

SPONSOR: TASC Proprietary Product

CONTACT(S): Mr John Huff, AFALC/XRS, AUTOVON 785-5146

DLSIE REF#: None

ASSESSMENT: TASC, via contract, will provide government users on IBM PC workstations with LOTUS 1-2-3 software, a communictions package and a local editor for developing, maintaining, and submitting LCCA runs to GEISCO for processing. LCCA is available to contract users through GEISCO author's catalog. TASC offers training and phone consultation to users. Hardware file sizes have been increased substantially over LCC2/2A. No software estimates have been developed. This is one of the preferred models currently available.

AS OF: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: LCC-2A - Program LCC Documentation - Version 2A

TYPE MODEL: Cost Estimating

DEVELOPED BY: Dynamics Research Corporation (DRC), Wilmington MA 01887

DATE COMPLETED: 11 July 1979

CURRENT REVISION: Original Version

PRODUCT DIV USE/SYSTEMS USED ON: ASD

DOCUMENTATION: Addendum to LCC-2 User's Guide, DRC E-51114, 11 July 1979

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: LCC-2A enhances the LCC-2 model to permit centralized intermediate level maintenance. It computes required intermediate level support equipment based on demand, allows a change from two-level to three-level maintenance, and offers additional output products.

REMARKS: The enhancements stated above were made primarily to accommodate use of the LCC-2 model for estimating LCC for the initial production contract of the USAF Standard Inertial Navigation System (INS) for the A-10.

ACCESS PROCEDURE: AFLC CREATE System. It is planned to transfer the program to a communications time-sharing system available to contractors.

SPONSOR: ASD/AEAC, Wright-Patterson AFB OH

CONTACT(S): Mr John Huff, AFALC/XRS, AUTOVON 785-5146

DLSIE REF#: None

ASSESSMENT: This is an enhanced version of LCC-2 which was developed by DRC under contract. The LCC-2 model is being phased-out. This enhanced version is one of the currently preferred models.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: LCC-2 - Program Life Cycle Cost Documentation-Version 2

TYPE MODEL: Cost Estimating

DEVELOPED BY: The Analytic Sciences Corporation (TASC), 6 Jacob Way, Reading MA 01867

DATE COMPLETED: April 1976

CURRENT REVISION: Original Version

PRODUCT DIV USE/SYSTEMS USED ON: ASD, Industry

DOCUMENTATION: Program LCC Documentation, Version 2, TASC TR-747-3, 28 April 1976.

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: This model evaluates costs of acquiring and supporting subsystems or LRUs over their operational life. This is an accounting-type model that is useful in comparing support concepts (two-level versus three-level maintenance), evaluating reliability improvement warranties, performing sensitivity analysis, and identifying important cost driving parameters in a system acquisition program.

ACCESS PROCEDURE: AFLC CREATE System

SPONSOR: ASD

CONTACT(S): Mr John Huff, AFALC/XRS, AUTOVON 785-5146

DLSIE REF#: None

ASSESSMENT: The use of this model is being phased-out. It is an accounting model which requires detailed description data concerning individual hardware items. It may not be useful during early acquisition due to the lack of detailed data. The size of the hardware system is limited. Software cost estimates are not developed. Recommended replacements are LCC-2A, LCCA and ONSCOST.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Item Repair Level Analysis (IRLA)

TYPE MODEL: Resource Estimating (Repair Level Analysis)

DEVELOPED BY: AFLC

DATE COMPLETED: 25 Jun 71

CURRENT REVISION: 25 Nov 83

PRODUCT DIV USE/SYSTEMS USED ON: ASD/PLSS.

DOCUMENTATION: AFLCM/AFSCM 800-4, 25 Jun 71.

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: IRLA is an RLA technique which prices the 3 repair level options (base, depot, scrap) for each LRU and SRU individually. The costs of required support equipment are prorated for each item. Then based on the minimum cost, a repair level decision is made for each item individually. While there is no approved Air Force computer program for IRLA, several contractors have developed their own versions.

REMARKS: IRLA was formerly known as Optimum Repair Level Analysis (ORLA).

ACCESS PROCEDURE: Being used by some contractors.

SPONSOR: AFALC/XRS

CONTACT(S): Mr Lawrence Briskin, AFALC/XRS, AUTOVON 785-5146

DLSIE REF#: None

ASSESSMENT: Use of the IRLA technique to perform Repair Level Analysis should be restricted to situations where support equipment represents a relatively small proportion of the total system cost. This is necessary due to each item's repair level decision being computed individualy, which can cause contradictory results such as depot repair of the LRU and base repair of its SRU. NRLA is the recommended repair level analysis technique used by the Air Force.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Dynamic Multi-Echelon Technique for Recoverable Item Control (Dyna-METRIC)

TYPE MODEL: Resource Estimating; Logistics Capability Assessment

DEVELOPED BY: RAND

DATE COMPLETED: Initial version, 1980

CURRENT REVISION: Latest revision, version 4.3, June 1984.

PRODUCT DIV USE/SYSTEMS USED ON: Air Logistics Centers, TAC, SAC, MAC.

DOCUMENTATION: Hillestad, R.J. Dyna-METRIC: Dynamic Multi-Echelon Technique for Recoverable Item Control, The RAND Corporation, R-2785-AF, July 1982. Air Force Logistics Management Center (AFLMC) has provided some documentation.

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model provides information about logistics support during potential wartime. It is used to determine spares constrained combat capability. It predicts not fully mission capable (NFMC) rates and sortie generation capability with "full-up" and "on-hand" war readiness spares kits (WRSKs). The model is a detailed multiple echelon, multiple indenture model for logistics capability assessment when repair demands and spare parts resupply are time dependent. The model consists of more than 15,000 lines of code.

REMARKS: The AFLMC developed a small version of the Dyna-METRIC model for use on CROMEMCO and Z100 microcomputers. The small version, called Miniature Dyna-METRIC, is appropriate for quick turnaround time when numerous runs are desired.

ACCESS PROCEDURE: Loaded on many ALC computers, such as HONEYWELL 6000

SPONSOR: Manager of RAND contract is Ms Pat Becker, AF/LEXY, AUTOVON 225-6712

CONTACT(S): Mr C.E. Neumann, AFLC/XRXA, AUTOVON 787-4239
Dr Thomas Gage, AFLMC, AUTOVON 446-3514

DLSIE REF#: 84/289 (LD49470MA)

ASSESSMENT: The Dyna-METRIC model may be used as both a capability assessment tool and a spares requirements determination tool. In the capability assessment mode the model assumes that spares consumption is based on scheduled sorties not sorties actually flown. This produces very conservative estimates of the actual sortie generation capability. (See AFLMC project LY831030, TSAR/Dyna-METRIC Comparison for a detailed discussion of this problem.) The model can also be used to perform spares versus cost versus availability trade-off analysis for various support kits.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Cost Oriented Resource Estimating Factors Model (CORE F)

TYPE MODEL: Cost Estimating

DEVELOPED BY: ASD/ALT

DATE COMPLETED: Ongoing effort

CURRENT REVISION: Model input data is being updated

PRODUCT DIV USE/SYSTEMS USED ON: ASD/various

DOCUMENTATION: User's notes; report being published

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model objective is to develop a detailed Line Replaceable Unit (LRU) and/or Shop Replaceable Unit (SRU) buildup by fiscal year for phase-in and steady state operation of the total force structure of the weapon system. Operation and Support (O&S) cost outputs are aggregated into dollars per flying hour and dollars per Primary Authorized Aircraft (PAA) for input into the CORE model. This model is a failure rate driven model. The methodology is sensitive to meantime between demand (MTBD) and maintenance manhours per flying hour (MMH/FH) and allows tradeoffs of reliability and maintainability (R&M) parameters.

REMARKS: The model is used for weapon system comparisons, programming exercises, Independent Cost Analyses (ICAs), source selections, Operation and Support (O&S) baselines, and life cycle cost tradeoffs.

ACCESS PROCEDURE: CDC 6600 System

SPONSOR: ASD/ALT

CONTACT(S): Mr Donald P. Breidenbach, ASD/ALT, AUTOVON 785-7958

DLSIE REF#: None

ASSESSMENT: This model provides a set of algorithms which may be used to develop CORE input data. It is helpful in developing CORE input factors when detailed design data are not available.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME. Cost Oriented Resource Estimating (CORE) Model

TYPE MODEL: Cost Estimating

DEVELOPED BY: Office of the Secretary of Defense (OSD), Cost Analysis Improvement Group (CAIG)

DATE COMPLETED: September 1981

CURRENT REVISION: 1984

PRODUCT DIV USE/SYSTEMS USED ON: ASD/Various

DOCUMENTATION: "User's Guide for the Timeshare Computer Program Implementation of the CORE Model" (Rev 1 Oct 83); AFR 173-13 "AF Cost and Planning Factors."

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model was developed under guidelines contained in the "Aircraft Operating and Support Cost Development Guide," published by the DOD Cost Analysis Improvement Group (CAIG). An interactive computer revision of the CORE model was developed by HQ USAF. The model develops a measure of the annual resources required to operate and support the basic quantity of a weapon sytem which constitues an operational unit. It sums the annual costs in eight major resource categories, including unit mission personnel, unit level consumption, depot maintenance, sustaining investment, installation support personnel, indirect personnel support, depot non-maintenance, and personnel acquisition and training. Each resource cost is itself a sum of lower level computations, in a hierarchical structure.

REMARKS: The model is currently used for weapon system comparisons, programming exercises, Independent Cost Analyses (ICAs), and Operation and Support (O&S) baselines.

ACCESS PROCEDURE: Via Boeing Computer Services (BCS), Conversational Terminal Service (CTS), and COPPER IMPACT TIMESHARE SYSTEM

SPONSOR: ASD/ALT

CONTACT(S): Mr Donald P. Breidenbach, ASD/ALT AUTOVON 785-7958
HQ USAF/ACMC, AUTOVON 227-2331

DLSIE REF#: None

ASSESSMENT: This model is the standard accepted procedure for developing operation and support cost estimates for aircraft systems.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Network Repair Level Analysis (NRLA) Model

TYPE MODEL: Resource Estimating (Repair Level Analysis)

DEVELOPED BY: AFALC/XRS

DATE COMPLETED: Nov 81

CURRENT REVISION: Jan 84

PRODUCT DIV USE/SYSTEMS USED ON: Contractors, System Program Offices

DOCUMENTATION: Users Guide, Jan 84; Programmers Guide, Aug 83

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: NRLA is an analytical model used to determine the repair level decisions for Line Replaceable Units/Shop Replaceable Units (LRU/SRUs). The analysis is accomplished using a network formulation of the repair level decision process. It allows for indentured relationships within the LRU/SRUs of the system and considers support equipment as a shared resource for the LRU/SRUs. The costs used to determine the repair level decisions are life cycle maintenance costs. The model does not include all life cycle costs, but only those directly related to the repair level decision process.

REMARKS: The model provides repair level decisions based on an economic analysis of the system. This must be used in conjunction with non-economic factors in determining the final repair level decisions. The NRLA model is a follow on to the Item Repair Level Analysis (IRLA) model developed in 1971. IRLA was formerly known as Optimum Repair Level Analysis (ORLA).

ACCESS PROCEDURE: AFLC CREATE; others (Model is transportable)

SPONSOR: AFALC/XRS

CONTACT(S): Mr Lawrence Briskin, AFALC/XRS, AUTOVON 785-5146
Lt Karen Cromer, AFALC/XRS, AUTOVON 785-5146

DLSIE REF#: 84/177 (LD 54281MA)

ASSESSMENT: The ability to share the cost of resources across the LRU/SRUs in a system makes this model extremely valuable. The model allows the user to force Repair Level Decisions if necessary and provides the optimal set of Repair Level Decisions based on the input data. NRLA is the Air Force's recommended model for Repair Level Analysis. It is widely used by government contractors.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Operations and Support Cost (ONSCOSTS) Model

TYPE MODEL: Cost Estimating

DEVELOPED BY: SD/ALX

DATE COMPLETED: April 1978

CURRENT REVISION: April 1980

PRODUCT DIV USE/SYSTEMS USED ON: Space Division, Directorate of Logistics and Acquisition Support

DOCUMENTATION: User's Manual and Programmer's Guide for the Operation and Support Cost Manual (ONSCOSTS)

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: This model is a computerized program derived from the equations originally developed for the Air Force Logistics Command, Logistics Support Cost model of 1975. ONSCOSTS expands and supplements these equations to yield estimated costs matrixed as initial fixed costs, annually recurring costs, and service life total costs by seventeen cost categories. The model calculates costs and statistics to five levels corresponding to five indentures of equipment.

REMARKS: The depth of output and the built-in options provide the capability of obtaining more rapid and more diversified estimates and trade-off studies than otherwise would be available.

ACCESS PROCEDURE: Model is transportable

SPONSOR: SD/ALX

CONTACT(S): Mr Robert Bruce/Mr Richard Roy, SD/ALX, AUTOVON 833-1810

DLSIE REF#: None

ASSESSMENT: It is currently used by Space Division, and is considered to be satisfactory for the current requirements. It makes possible the evaluations of a larger number of alternatives than would otherwise be available.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Optimized Reliability and Component Life Estimator (ORACLE)

TYPE MODEL: Reliability

DEVELOPED BY: Originally by Army, RADC became Office of Primary Responsibility (OPR) in 1970

DATE COMPLETED: RADC began using the model in 1970, and has been updating the model on an annual basis.

CURRENT REVISION: Model is updated annually.

PRODUCT DIV USE/SYSTEMS USED ON: RADC

DOCUMENTATION: Users Guide and Instruction Package

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: This model provides the software implementation of Military Handbook 217. It is the procedure for automating the calculations in Handbook 217. It produces the failure rate per million hours and MTBF (meantime between failure) in hours for electronic equipment. The system is a query program which allows for on-line creation and appending of input data bases, running a search routine to extract part-dependent parameters from the part dependent data base, and running the reliability prediction routines. Outputs may be obtained either at the user's terminal or at the RADC high speed printer. The program also includes provisions for editing the input for error correction and parameter variation for playing What-If-Games.

ACCESS PROCEDURE: Honeywell DP88 Multics Operating System/FORTRAN IV. In order to access the model, potential users must make arrangements for the costs of computer operation and RADC direct manpower/support to be reimbursed to RADC.

SPONSOR: RADC/RBET

CONTACT(S): Mr George Lyne and Ms Florence Winter, RADC/RBET, AUTOVON 587-3068

DLSIE REF#: 84/261 (LD 56152MA)

ASSESSMENT: This model is a computerized version of the procedures and data that are published in Military Handbook 217. It is recognized as a solid method of predicting the reliability of electronics components. Accurate prediction is necessary as it provides one of the most significant factors in planning for the maintenance of a system or in achieving design changes to increase reliability and thereby lower maintenance requirements.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Programmed Review of Information for Costing and Evaluation Life Cycle Cost (PRICE L)

TYPE MODEL: Cost Estimating

DEVELOPED BY: RCA Price Systems

DATE COMPLETED: 1976

CURRENT REVISION: 1980

PRODUCT DIV USE/SYSTEMS USED ON: ASD monitors the contract for all Air Force users.

DOCUMENTATION: Proprietary

PROGRAM LANGUAGE: The Air Force has no access to the code.

DESCRIPTION/CHARACTERISTICS: The model estimates the LCCs of a wide variety of electrical, electromechanical, or mechanical systems. It may be used to tailor analyses to fit a wide variety of maintenance concepts and supply systems which may be custom designed for specific programs and user organizations. It is based on parametric methodology.

REMARKS: The PRICE L model operates with PRICE H.

ACCESS PROCEDURE: On-Line System (OLS), UNINET. RCA maintains proprietary control of this model, and the model is available only through a lease arrangement.

SPONSOR: ASD/ACCC

CONTACT(S): Lt John Jones, ASD/ACCC, AUTOVON 785-6347

DLSIE REF#: None

ASSESSMENT: This model is sometimes used as a cross-check for operation and support cost estimates in cases where PRICE H has been used for the research and development and procurement cost estimates and design data are inadequate for running other models. However, it is considered that the model, in its present form is not as valid for Air Force purposes as the LCC-2A, or LCCA models.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Programmed Review of Information for Costing and Evaluation Software Life Cycle Cost Model (PRICE SL)

TYPE MODEL: Cost Estimating

DEVELOPED BY: RCA Price Systems

DATE COMPLETED: 1979

CURRENT REVISION: 1983

PRODUCT DIV USE/SYSTEMS USED ON: ASD monitors the contract for all Air Force users.

DOCUMENTATION: Proprietary

PROGRAM LANGUAGE: The Air Force has no access to the code.

DESCRIPTION/CHARACTERISTICS: To provide cost and schedule estimates as well as sensitivity and schedule effect analyses. The model has been designed to be used in conjunction with the PRICE S model which provides the development costs and further utilizes the same design parameters. PRICE-SL estimates the support costs which are subdivided into the maintenance, enhancement, and growth activities. The total cost summary of development and support costs are output.

REMARKS: The PRICE SL model operates with PRICE S.

ACCESS PROCEDURE: On-Line System (OLS), UNINET. RCA maintains proprietary control of this model, and the model is available only through a lease arrangement.

SPONSOR: ASD/ACCC

CONTACT(S): Lt John Jones, ASD/ACCC, AUTOVON 785-6347

DLSIE REF#: None

ASSESSMENT: The model is used for software operation and support cost estimates after the PRICE S model is used for the software cost estimates. It has been seen by cost analysts in the Air Force Avionics Laboratory and the estimates generated by the model have been clost to the cost history of the software programs chosen for validation purposes. It is considered one of the best (or the best) software prediction models available. However, it has the disadvantages from the Air force perspective of being a proprietary model.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Reliability, Maintainability and Cost Model (RMCM)

TYPE MODEL: Cost Estimating; Reliability

DEVELOPED BY: Westinghouse Electric Corporation, Integrated Logistics Support Division, Hunt Valley MD 21031

DATE COMPLETED: Initial version, 1982

CURRENT REVISION: Development work is still in progress

PRODUCT DIV USE/SYSTEMS USED ON: Model still in development

DOCUMENTATION: Asset User's Guide, 7 Feb 82

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model is an interactive mathematics program with built-in sensitivity analysis capability. The program consists of two parts:

1. The Reliability and Maintainability (R&M) model aggregates support demands at the Line Replaceable Unit (LRU), subsystem, and system level to access the total resource requirements.

2. The cost model applies cost factors to the assessed resource values generated by the R&M model and then combines the results with other cost elements to estimate LCC.

The output is the total LCC of the system, subsystem, or LRU.

REMARKS: The model is designed for use during early acquisition stages and for design trade-offs.

ACCESS PROCEDURE: CDC 6600 System

SPONSOR: AFHRL/LRL

CONTACT(S): Dr W. B. Askren, AFHRL/LRL, AUTOVON 785-3871

DLSIE REF#: None

ASSESSMENT: A team of AFIT students are working to adapt the model for use on microcomputers. It is planned to tie the program into future CAD (Computer Aided Design) efforts and for use by design engineers working on postulated Air Force weapon systems.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: SACDIN Repair Level Analysis Life Cycle Cost Model

TYPE MODEL: Cost Estimating; Resource Estimating

DEVELOPED BY: ESD/ALL

DATE COMPLETED: March 1981

CURRENT REVISION: March 1984

PRODUCT DIV USE/SYSTEMS USED ON: ESD/SACDIN Program

DOCUMENTATION: User's Guide

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The program combines Repair Level Analysis (RLA) and Life Cycle Cost (LCC) using recommendations of the RLA to drive inputs to the LCC calculations. Built-in sensitivity analyses are performed, and certain variables can be modified at the beginning of program execution. The RLA portion was tailored from the AFLCP 800-4, Optimum Repair Level Analysis (ORLA) program generated by WR-ALC. RLA makes "discard" vs "repair at Centralized Intermediate Repair Facility (CIRF) or Depot" cost comparisions for SACDIN Snop Replaceable Units. Intermediate repair is not a consideration for SACDIN. RLA costs are then the inputs to LCC computations, which are done as a subroutine. Outputs show investment costs and recurring costs in both constant and then-year dollars.

REMARKS: A subset of the model has been developed into a stand-alone SACDIN Spares Model, which uses equipment siting matrix to calculate spares requirements. Sacramento ALC is using this spares model to assist in provisioning.

ACCESS PROCEDURE: AFLC CREATE

SPONSOR: ESD/SCS-3 (SACDIN Program Office)

CONTACT(S): Mr Joe Albergo, ESD/ALL, AUTOVON 478-2002

DLSIE REF#: None

ASSESSMENT: ESD/AL has integrated the model output into formal program assessment/reviews. It is used to evaluate all engineering change proposals (ECPs) and to perform trade studies. It is considered to provide valid estimates and the results are accepted by management. It is a quality model with credible output products, and should continue to be used and supported.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Standardization Evaluation Program (STEP 3)

TYPE MODEL: Cost Estimating

DEVELOPED BY: The Analytic Sciences Corporation (TASC), 6 Jacob Way, Reading MA 01867

DATE COMPLETED: 1978

CURRENT REVISION: 1984

PRODUCT DIV USE/SYSTEMS USED ON: AFLC/ASD/ALC/contractors

DOCUMENTATION: Step 3 Programmers' Guide, April 1984

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: This model is used to evaluate life cycle cost impacts on potential applications of common avionics for different weapon systems. The method is an interactive facility which analyzes benefits of applying common avionics in multiple aircraft programs. It can be used to analyze Snop Replaceable Unit (SRU) costs along with Line Replacable Unit (LRU) costs. It was developed especially for analysis of Air Force avionics equipment, although with modifications it may be used for other applications.

REMARKS: This model is used on ITEL. The user is allowed to maintain as many data bases as space will allow on the system. The model is primarily used for avionics applications.

ACCESS PROCEDURE: ITEL (Ref, pg 2-1, LCC Models Ref Guide Apr 84)

SPONSOR: ASD/XP

CONTACT(S): Mr Ernest Curry, ASD/AXP, AUTOVON 785-8076

DLSIE REF#: None

ASSESSMENT: The model has been used in-house on a large number of avionics life cycle cost studies. It is being made a contractual requirement by some program offices.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Support Capability Assessment Model (SCAM)

TYPE MODEL: Resource Estimating (Spares Computation)

DEVELOPED BY: AFLC/XRP

DATE COMPLETED: 1977

CURRENT REVISION: Original version

PRODUCT DIV USE/SYSTEMS USED ON: Initially the model was used for POM assessments of aircraft replenishment spares.

DOCUMENTATION: Informal notes

PROGRAM LANGUAGE: FORTRAN, BASIC

DESCRIPTION/CHARACTERISTICS: The model computes replenishment spares. The methodology computes the cost of spares per flying hour per year. The model reviews sources of available assets by weapon system. The model considers wartime requirements by month.

REMARKS: The model is not item specific. It does not identify spare parts.

ACCESS PROCEDURE: CREATE; later on minicomputer TEKTRONIX 4054

SPONSOR: AFLC/XRPA

CONTACT(S): Mr Thomas Raether, AFLC/XRPA, AUTOVON 787-2622

DLSIE REF#: None

ASSESSMENT: Work is in progress on a model which will provide item specific information. The new model is designated the Logistics Requirements Analysis Model (LOGRAM) and is currently being tested on a prototype version. It is expected that the model will provide significant improvement over the currently available procedures.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Theater Simulation of Airbase Resources (TSAR)

TYPE MODEL: Logistics Capability Assessment

DEVELOPED BY: RAND

DATE COMPLETED: February 1982

CURRENT REVISION: February 1982

PRODUCT DIV USE/SYSTEMS USED ON: AF/SA / F-4, F-15, A-10, NATO Airbases, etc.

DOCUMENTATION: TSAR User's Manual and Model Documentation, RAND document numbers N-1820-AF, N-1821-AF, N-1822-AF; Intro to TSAR Simulation Program, R-2584-AF.

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: TSAR is a Monte Carlo event model which simulates a system of interdependent theater airbases, supported by shipments from the continental U.S. and by intratheater transportation, communication, and resource management systems. The model uses interdependencies among 11 classes of resources to analyze the interrelations among on-base resources and the ability to generate aircraft sorties in a dynamic wartime environment. On equipment maintenance tasks, parts and equipment repair jobs, munitions assembly, and facility repair tasks are simulated for each of several airbases. Asset accounting for each of 11 classes of resources, and for each type within each class, permits assessment of a broad range of policy options that could improve the efficiency of resource utilization on a theater-wide basis.

REMARKS: Requires detailed understanding of air base scenarios, resources, and war games for entire theatre before it can be used effectively. Requires very large data base. Has a very extensive code (over 30,000 lines).

ACCESS PROCEDURE: HQ/AF on IBM, and VAX 730 at USAFE (future)

SPONSOR: RAND

CONTACT(S): Lt Col John S. Folkeson, AF/SAGP, AUTOVON 227-0682
Lt Col John Halliday, RAND, Commercial (213) 393-0411, ext 486
Mr Donald E. Emerson, RAND, Commercial (213) 393-0411, ext 309

DLSIE REF#: 84/315 (LD 54282MA)

ASSESSMENT: A companion model, TSARINA, develops data for TSAR runs which assess air battle damage impacts of sorties against theatre bases. Computer parameter space is being enhanced (TSAR Version III) to permit studies of chemical warfare impacts. It is expected that the model will be used to provide the Air Force with a significantly expanded capability. HQ USAF/SAGP is currently exercising the model.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: TI-59 Programmable Calculator LCC Model

TYPE MODEL: Cost Estimating

DEVELOPED BY: ASD/ACC

DATE COMPLETED: 1978

CURRENT REVISION: April 1981

PRODUCT DIV USE/SYSTEMS USED ON: ASD

DOCUMENTATION: LCC User's Handbook (Rev Apr 81)

PROGRAM LANGUAGE: TI-59 Programming Language

DESCRIPTION/CHARACTERISTICS: This model enables the user to perform design trade-offs and to capture the design impacts on LCCs. The model concentrates on Line Replaceable Units (LRUs) and Shop Replaceable Units (SRUs). However, it may be used to aggregate costs to the system level where a system involves a small number of LRUs or where details about the LRUs and SRUs are not known. The TI-59 model is based on Logistics Support Cost (LSC) type methodology.

REMARKS: The model is used as an aid in making logistics assessments, establishing LCC baselines, evaluating organic support costs, assessing repair level and support equipment alternatives, and performing sensitivity analyses. TI-59 out of production; SOLE training using this model has been discontinued. Follow-on training is being studied.

ACCESS PROCEDURE: TI-59 Programmable Calculator

SPONSOR: ASD/ALT

CONTACT(S): Mr Donald P. Breidenbach, ASD/ALT, AUTOVON 785-6217

DLSIE REF#: None

ASSESSMENT: Useful for evaluation of logistics support cost differences among different designs/configurations of a single hardware item. It is widely used.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Unmanned Spacecraft Cost Model

TYPE MODEL: Cost Estimating

DEVELOPED BY: SD/ACCE

DATE COMPLETED: Started in 1960s

CURRENT REVISION: Fifth Edition, June 1981

PRODUCT DIV USE/SYSTEMS USED ON: SD

DOCUMENTATION: Space Division Unmanned Spacecraft Cost Model, SD-TR-81-45, June 1981

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The Unmanned Spacecraft Cost Model is an approximation of the real world based upon mathematical relationships derived from analyses of historical cost data. The model addresses platform hardware costs only, and except for communications payloads, it does not include mission hardware. Launch vehicles, stage vehicles, and their ground equipment are not included within the scope of the model. Cost estimating relationships (CERs) relate costs at the subsystem level (structure, electrical power supply, etc.) to subsystem physical and performance characteristics. Spacecraft costs (both development and production) are segregated between nonrecurring and recurring efforts. The (CERs) are based on burdened costs (direct plus indirect) with general and administrative (G&A) costs included.

REMARKS:

ACCESS PROCEDURE: Programmed on HP 9845 Microcomputer

SPONSOR: SD/ACCE

CONTACT(S): Mr Michael Koscielski, SD/ACCE, AUTOVON 833-1772

DLSIE REF#: None

ASSESSMENT: This model is generally recognized as the most widely applied spacecraft cost estimating tool with the broadest data base currently available. It has received recognition by DOD.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Wartime Assessment and Requirements Simulation Model (WARS)

TYPE MODEL: Logistics Capability Assessment; Resource Estimating

DEVELOPED BY: Under contract

DATE COMPLETED: In development

CURRENT REVISION: Model extensions are being developed

PRODUCT DIV USE/SYSTEMS USED ON: In development

DOCUMENTATION: Incomplete

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model computes squadron wartime spares requirements. The requirements are accumulated by location and type of aircraft. The model includes a prioritization matrix to apply or assign spares by squadron according to priority and by days of support or conflict.

REMARKS: The model is being tested by CONTEL.

ACCESS PROCEDURE: AMDAHL computer; model is being run by CONTEL, Dayton OH.

SPONSOR: AFLC

CONTACT(S): Mr Steve Stewart, AFLC/MMMG, AUTOVON 787-5275
Mr Jack Hill, AFLC/XRS, AUTOVON 787-6531

DLSIE REF#: 84/159 (LD 56198M)

ASSESSMENT: It is expected that the model will provide the capability of computing squadron wartime spares requirements more realistically than has been done in the past.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Workload Assessment Model

TYPE MODEL: Resource Estimating (Personnel Allocation)

DEVELOPED BY: ESD/ALL

DATE COMPLETED: Early 1982

CURRENT REVISION: Expected to be revised as organizational changes occur within the product division.

PRODUCT DIV USE/SYSTEMS USED ON: ESD

DOCUMENTATION: Briefing charts currently available. The model has been briefed to other AFSC product divisions. Users manual may be prepared later.

PROGRAM LANGUAGE: FORTRAN

DESCRIPTION/CHARACTERISTICS: The model was developed to provide an equitable method of allocating logisticians to the program offices and electronic programs at Hanscom AFB. The need for the model was generated because of the limited number of logisticians available to support the large number of requests for logistics support. The model measures the relative logistics workload in each program office. The model gives weight to such key load factors as number of countries involved in the program, whether the program is multi-service or Air Force only, whether the program is multi-command or single command, number of contracts involved, total dollar value of program, dollar value of 3600 funds, number of locations, levels of management review, and special contract provisions.

REMARKS: Model uses computer programs and data files specifically developed for communication, command, control, and intelligence (C^3I) system acquisition programs. Application to other systems would require some modification to the computer programs and development of new data files. Estimated time to get on line is 60-90 days.

ACCESS PROCEDURE: AFLC CREATE

SPONSOR: AFALC/LWE

CONTACT(S): Mr Joseph P. LaBelle, ESD/ALL, AUTOVON 478-3852

DLSIE REF#: None

ASSESSMENT: ESD/AL has used the model successfully for the determination of logistics manpower allocations with a high degree of acceptance by management.

As of: 18 Sep 84

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME: Full name, acronym in parentheses

TYPE MODEL: General category for subject indexing: Cost Estimating, Logistics Capability Assessment, Reliability, Resource Estimating, Scheduling, or Report Generators and Miscellaneous Models/Techniques. (Other categories as required.)

DEVELOPED BY: Organization or company responsible for development

DATE COMPLETED: Date of original version

CURRENT REVISION: Current revision number and/or date

PRODUCT DIV USE/SYSTEMS USED ON: Parent organization/programs used on (ie. ASD/B1-B, F-15,... ; SD/all programs, etc.)

DOCUMENTATION: Name and date of Users Guides, Programmers Manuals, etc.

DESCRIPTION/CHARACTERISTICS: A general narrative description of what the model is and what it does. Include general information on required input data, output results, computer program language used, and solution techniques employed.

REMARKS: Identify any special requirements for using the model, limitations on its use, specialized applications, current work on the model, or other information peculiar to the model/technique.

ACCESS PROCEDURE: Identify the computer(s) the model is used on, general access requirements, and if a dial-up capability exists for accessing the model. (Do not include phone numbers or access procedures.)

SPONSOR: Name/office symbol of the organization originally sponsoring the model, if known.

CONTACT(S): Name, organization, and telephone numbers of principal contacts for detailed information on the model/techniques use and access.

DLSIE REF#: YY/###, (DLSIE #) (YY/### = Year of DLSIE catalog/item number)

ASSESSMENT: Comments on the strengths/weaknesses of the model/technique and considerations for its use and application. Include an evaluation of the model's currency and any potential replacements or modifications planned or in progress. Is the model currently used? Does management find the model useful? Should we continue to support it? These are the type of questions which should be asked when making the assessment.

As of: date of review

LOGISTICS ANALYSIS MODEL/TECHNIQUE DATA

MODEL/TECHNIQUE NAME:

TYPE MODEL:

DEVELOPED BY:

DATE COMPLETED:

CURRENT REVISION:

PRODUCT DIV USE/SYSTEMS USED ON:

DOCUMENTATION:

DESCRIPTION/CHARACTERISTICS:

REMARKS:

ACCESS PROCEDURE:

SPONSOR:

CONTACT(S):

DLSIE REF#:

ASSESSMENT:

As of: _____

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